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Evidence from a Provider Payment System Demonstration in the Former Soviet Union: Lessons for Primary Care?

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Executive Summary

Jack C. Langenbrunner and Igor Sheiman presented findings from a study on a provider payment system demonstration in the Soviet Union to the Association for Health Services Research in June 1995.

The health sectors of the countries of the former Soviet Union have enjoyed a tradition marked by universal access to health care services as well as by considerable investments from central organizations in curative medicine, prevention, water and sanitation. Over the last five to ten years, however, socioeconomic and environmental problems have severely strained both the health of the population and the health care system. Inefficiencies and structural problems have resulted.

Since early 1992 Kazakhstan has debated a new national health care reform law that emphasizes primary care and seeks to change both the management and financing of care. An Abt Associates team of health care professionals, in conjunction with leadership from the Kazakhstan Ministry of Health and the South Kazakhstan Ministry of Health, conducted an evaluation of health care financing, management, and care delivery changes in the Dzheskasgan oblast. The evaluation reviewed how and if the initiatives implemented in Dzheskasgan affected technical and allocative efficiency.

Analyses of several different measures indicate a generally positive change toward greater allocative efficiency in the Dzheskasgan oblast. Structural components of the health care system, such as relative cost effectiveness across settings for a comparable case as well as interaction between medical facilities and alternative settings, became more efficient. However, analyses of technical efficiency measures, such as hospital admissions/discharges, outpatient visits, and classes of procedures, showed less positive and mixed results.

The Dzheskasgan oblast evaluation demonstrates how new methods of financing, payment, and management through incentives for primary care providers and formation of primary care groups with physician sub-specialists promote structural change. This demonstration provides an alternative organizational model and approach for similar issues, such as the underprovision of primary and preventative care and the mix of specialists relative to primary care physicians, currently debated in the United States.

Slides and data tables used in the presentation are included in this document.

Background on the Kazakhstan Health System

The health sectors of the countries of the former Soviet Union have enjoyed a tradition marked by universal access to health care services as well as by considerable investments in curative medicine, prevention, water and sanitation. The health of the population has benefitted from this tradition. Over the last five to ten years, however, socioeconomic and environmental problems have severely strained both the health of the population and the health care system.

Kazakhstan, one of the newly-independent countries and immediately south of the Russian Federation, is no exception to both these general historic patterns of investment and to more recent obstacles. Table 1, located on pages 18-19, provides a series of latest comparative data on the country's population, social and demographic data, morbidity and mortality, and use of resources in the health sector. It provides a comparison with other selected countries as well as an average for twenty four Organization and Economic Cooperation (OECD) countries.[1]

Kazakhstan is a study of contrasts and diversity. While a nation of less than 17 million people, it is nevertheless extremely diverse ethnically and geographically (see, for example, World Bank report, 1993). Kazakhstan has the second largest land mass in the former Soviet Union; it has five times the land mass of the France with less than one-third the population. The land is characterized not only by mountains and fertile valleys, but also by large areas of dry, largely barren steppes. At the same time, the land contains large endowments of precious metals and oil reserves thought to equal those of Saudi Arabia.

The people of Kazakhstan are ethnically diverse: Kazakhs represent the largest group at just above 40 percent; Slavs represent just less than 40 percent; Germans, Koreans, and others comprise the remainder.

Life expectancy in Kazakhstan is roughly 63.9 years for males and 73.1 years for females. Infant mortality rate at 32 per 1,000 births is extremely high, though reportedly lower than some other Central Asian republics. The leading causes of death are cardiovascular diseases, cancer, and respiratory diseases. Epidemic diseases (cholera, plague, typhus) are well under control, except for tuberculosis which is prevalent among adolescents and young adults. Preventable childhood diseases are thought to be under relative control through immunizations (World Bank, 1993).

The health sector of Kazakhstan reflects the rational planning and hierarchic structure found throughout the former Soviet Union health system. In urban areas, each individual is assigned to a clinic and has a primary care physician practicing within the clinic; in rural areas, there is a basic health unit of one or more physician-extenders (e.g., feldshers or nurses) and some limited supply of medicines. In general there is no consumer choice, nor are there any private solo

[1] There are more recent OECD data (see, for example, Schieber, Poullier, and Greenwald, Health Affairs, Fall 1994) but earlier data are used from 1991 for comparison purposes.

practitioners or private clinics. Patients need a referral to move to a higher level of the system. Depending upon the seriousness and complexity of a patient's condition, he or she would be referred progressively to better equipped facilities—a local hospital, a central rayon (district) hospital, and an oblast-level hospital.[2] Each level hospital has both inpatient and outpatient (polyclinic) facilities associated with it. There also are a limited number of national level centers of research and treatment for both inpatient and outpatient care.[3] Table 2, located on page 20, provides a breakout of institutions at each level for Kazakhstan.

Historically, the system has been financed in a centralized "top-down" bureaucratic allocation process, based upon national budgets formulated and passed by the central legislative and policy-making bodies. However, the share of the region's GDP devoted to health has declined precipitously since the 1980s—falling from 6 percent of GDP to just over 3 percent of GDP for the NIS as a whole. In Kazakhstan, health spending as a percent of GDP was 3.3 percent in 1990, but estimated to have dropped in real terms to 1.6 percent in 1992. This figure is extremely low compared either to OECD expenditures or to other countries with comparable levels of per capita income (OECD, 1993). The economic decline that Kazakhstan (and most other parts of the NIS) has suffered over the past several years further has contributed to reduced locally generated tax revenues.[4] An emerging funding crisis in health services has resulted.

Furthermore, the Soviet approach to health care delivery did not encourage efficient use of resources by or between providers. This was due in part to a system which allocated resources based on traditional central planning production input measures, such as occupancy and numbers of staff and beds, rather than on the basis of actual services provided, the relative complexity of those services, or (ultimately) changes in health outcomes. An emphasis was placed on quantitative rather than qualitative goals. A formula of eighteen production input categories (e.g., salary, food, pharmaceuticals) was used for each facility, with providers unable to spend monies across categories or carry-over these budgets from year-to-year.

The resulting inefficiency can be seen, for example, in Table 1 data, located on pages 18-19, on the average number of physicians per 1,000 population (4.2 in Kazakhstan vs 2.4 on average for OECD countries), beds per 1,000 (13.6 in Kazakhstan vs. 9.2 on average for OECD countries, 4.9 on average for all middle income countries and 83.8 on average for all upper income countries) and length of stay (ALOS)

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[2] There are a total of 19 oblasts in the country overall. Oblasts can be considered a rough geographic and politico-economic unit equivalent to a U.S. state.

[3] A more detailed discussion of both the Soviet structure and the Kazakhstani health system can be found elsewhere (e.g., Schieber, 1992; Laurisden, 1992).

[4] A February 1994 report from the federal Ministry of Health stated that economic activity for the country had declined 32% in the last year.

in somatic hospitals (17 days in Kazakhstan vs. 11.9 days in Canada, 15.2 days in Germany, and 9.1 days in the U.S.). The average length of stay is approximately nine days for upper income countries.[5]

Part of this extensive development can be attributed to the relatively high health needs of the population as reflected in higher incidence of morbidity and rates of mortality. Kazakhstan also faces low standard of living conditions, difficult environmental and ecologic problems, low population density and long distances between populated areas, and problems of transport and communication.

Nevertheless, dis-incentives for efficient use of resources continue and exacerbate the general problem of underfunding. For example, hospitals receive budgets based on numbers of beds, which discourages hospitals from decreasing excess bed capacity and encourages cut-backs on other, associated hospital resources. Government-set bed-occupancy standards further creates dis-incentives for accepting referrals from outpatient clinics (polyclinics) and keeping patients longer than necessary.[6]

Other areas of continuing concern are the bias of curative care over primary care and the efficiency of physicians practicing in the polyclinics. Less than 15 percent of the country's physicians provide primary care (compared with about 70 percent in Germany; 56 percent in Canada). Physician-care budgets are developed and based on "capacity of the polyclinic" as measured by staff and *potential* numbers of visits. Polyclinics develop by increasing its numbers of low-paid, salaried physicians. The lack of competition and choice, as well as the lack of incentives to increase income, tends to encourage physicians to act as indifferent dispatchers referring patients to hospitals (Sheiman, 1992). Referral rates to hospitals appear to run about 30 percent of first visits to polyclinics[7] relative to 8.6 percent in the United Kingdom and 5.2 percent in the United States (Sandier, 1989). Hospital admission rate as a percent of population is 22 for Kazakhstan relative to 16.2 on average for all OECD countries; this difference can be attributed in part by the higher referral rate.

Overall, a relatively high share of resources are allocated to more expensive inpatient care—64.3 percent in 1990 and 73.8 percent in 1992 according to Ministry of Health estimates (April, 1994). A comparative indicator for OECD countries, hospital use plus long-term care, is around 50 percent.

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[5] The international experience further shows a correlation between average length of stay and availability of hospital beds. The higher the bed density per 1,000 population, the greater the propensity to keep patients hospitalized (OECD, 1993).

[6] At the same time, longer lengths of stay can be attributed to the relative lack of modem technology, absence of tertiary care, and the low productivity of staff.

[7] Based on analysis and discussions in two oblasts -- Dzheskasgan and South Kazakhstan.

There are other health sector problems; they include:

- most facilities are run-down or dilapidated;
- low quality care, as measured by outmoded medical practices and equipment;
- serious shortages of supplies and pharmaceuticals coupled with inappropriate use of drugs (polypharmacy).[8]

Health Reform and Health Insurance

Since early 1992 the Kazakhstan Parliament has debated a new national health care reform law that gives greater emphasis to primary health care, and seeks to change both the management and financing of care. Decision-making would be decentralized and non-government health care and consumer choice would be introduced.

Single-payer trust funds would be established in each oblast. A new employer-based payroll tax ("contribution") would finance the system, with monies coming from the general revenues of the central and oblast government for special populations such as the elderly, the unemployed, and the disabled. The insurance will cover a basic package of services. Private "voluntary" coverage could provide additional services. There would also be:

- organization and management restructuring—through greater autonomy and management systems;
- improved internal efficiency in the delivery of care-through improved incentive-based payment systems for services within and across facilities.

While the proposed law has yet to be passed, a number of local geographic areas have moved forward with the outlines of this proposed law, changing the financing, payment systems, and structure of health care delivery. The reforms were first initiated in 1989 under the so-called New Economic Mechanisms (NEM) developed and approved in Moscow under the former Soviet structure. The NEM provided for greater local autonomy and a number of demonstration sites in each of the republics.

In the spring of 1994, at the request of Kazakhstan Ministry of Health, an evaluation was conducted of one geographic area that has participated in a financing and payment demonstration since 1989—Dzheskasgan oblast in northern Kazakhstan near the Russian border. A team of specialists from Abt Associates Inc., in conjunction with leadership of the Kazakhstan Ministry of Health and the South Kazakhstan Ministry of Health, visited Dzheskasgan oblast. The team

[8] Currently, pharmaceuticals are free for inpatient care; outpatient costs are borne by direct out-of-pocket payments. Prices recently have been deregulated creating additional financial barriers.

was composed of specialists from several disciplinary fields: economics, finance and data analysis, medicine, and public health. Several nationalities were also represented: Kazakhstan, Russia, Bangladesh, United States.

Four areas regarding health policy changes were examined: 1) adequacy of financing, or to what extent a new employer payroll contribution and other sources of revenue ensures adequate financing of the health care system; 2) changes in efficiency, or the effect of new incentive-based payment policies and organizational changes on the efficiency in the provision of services; 3) impact on quality of care, and ultimately changes in health status; and, 4) impact on equity of access to care, or what effects the new system have on the strengths of the old system—relative equity of access to services by various socioeconomic status groups.

Multiple methods were utilized in the evaluation including: 1) development of a static spreadsheet impact and simulation model; 2) collection and analysis of pre-post intervention data as well as comparative trend data from other oblasts and the country as a whole; 3) surveys of health care providers and consumers; and 4) expert interviews. At each site the team met with local leadership, experts, managers, health providers, and economists.

In this paper, we present methods and findings for one area of focus, namely, changes in efficiency from organizational and payment system reforms.

Dzheskasgan Oblast Demonstration Design

The demonstration was organized at the local level by the "territorial" medical organization (TMO), the representing professional body for local providers and facilities, when the so-called New Economic Mechanisms (NEM) were announced. The TMO restructured the financing, organization and payment of health care along several significant dimensions. They include:

- new financing sources and the creation of a new health insurance fund for pooling a more diverse set of revenue flows (relative to the former budget allocation from general revenues): a new 4-5 percent employer-based payroll tax; a flat, capitated rate of payment from the state for remaining population groups such as the unemployed, elderly, and disabled; other funding sources (e.g., charity contributions, out-of-pocket payments for outpatient pharmaceuticals);

- establishment of multiple units of primary care groups (PCGs or APTK, the Russian acronym[9]) from staff of polyclinics which acted as "fundholders"—capitated budgets were held and distributed by the APTKs based on patient referrals and management structure in other parts of the local delivery system. The APTK units were not completely at financial risk but were "economic" units only, whereby revenues and cost experience was

[9] Both acronyms are used interchangeably throughout this paper.

used to adjust salaries and determine bonus payments according to annual cost performance. The groups were typically composed of 8-11 staff including a pediatrician, an internist, an obstetrician/gynecologist, nurses and staff aides;

- payment to hospitals based on a simplified case-mix adjusted flat payment per case basis. Initially, there were only seven categories, with one for each clinical department found in a typical hospital (e.g., pediatrics, oncology, surgery). Rates were established on average bed-day cost experience (on a facility-specific basis) from 1985-1990;

- establishment of a system of strong administrative controls and monetary "penalties" directly assessed on individual providers, to increase incentives for better quality of care. Local medical teams established several hundred peer review based protocols using both process and outcome standards. The protocols are disease-specific and have been developed for both inpatient and outpatient care. The protocols incorporate both national standards and local practice standards;[10]

- development of a series of contracts between all facilities and the TMO, that set out catchment areas for responsibility of care, as well as utilization and quality standards. The TMO, in turn, signed a similar contract with the health insurance fund organization.

Later, there were changes in the method of inpatient care to a more refined case-mix payment system. Protocols developed for quality review also were used as payment categories. Protocols included standards for hospital lengths-of-stay necessary for treatment. Payments per inpatient stay were effectively "capped" based on these bed-day standards, in turn creating levels of reimbursement that hospitals could "spend-up" to for each admission.

These reforms were implemented fully by the end of 1990/early 1991.

Methods of Evaluation

The evaluation reviewed the performance of the demonstration to identify if and how it affected efficiency.

The evaluation utilized a working definition of efficiency as the optimal or minimal mix of inputs, such as labor and capital, to provide a defined output or product. At the same time, the evaluation team recognized that measuring efficiency in health care can be constrained or limited by several factors, such as:

[10] The Health Insurance Fund organization, through physician experts on its staff, reviews medical records in polyclinics and hospitals using the protocols as standards. Monetary penalties are levied upon TMO for violations; TMO, in turn, determines which specific providers are at fault.

- understanding the best mix of inputs. Health care services use a mix of science and technology, but these require less definable cognitive and interpersonal aspects of care. The mix of these elements is not always well-defined and may change over time. New medicines and procedures may also be introduced. Often an illness or episode of care requires multiple sets of separate inputs such as physician visits, hospital care, and home care following discharge;

- clearly defining the product or output. For hospitals, the product can be determined by such things as hospital discharge. For polyclinics the product can be determined by outpatient visits or numbers of tests. But hospitals and clinics may have other functions or objectives such as psycho-social needs of individuals and community support and outreach;

- relative severity of cases. Even when functions and objectives are well-defined, outputs must factor in attributable changes in health outcomes such as morbidity and mortality. Adjusting for relative severity of the case for comparison purposes and then correlating some mix of inputs to attributable changes in health status remains an inexact science.

Because of these limitations, a "second best" solution was utilized to examine multiple measures that may be indicative of relative efficiency. Patterns across multiple measures and over time can help infer attributable changes in efficiency. This evaluation examined changes in efficiency by focusing on multiple measures for two levels or two types of efficiency commonly used for health sector analysis. At one level, it is important to examine the "production" of care at the facility level, or the "technical efficiency" of care. A second level of efficiency is "allocative efficiency" which focuses more broadly on how resources are used or allocated across settings of care to achieve the best possible outcomes for the entire health sector.

Data for multiple measures for each type of efficiency were gathered across facilities and over several years (1990 through 1993) wherever possible. These years were chosen to allow a baseline or pre-intervention comparison with subsequent changes. Data were drawn from available aggregate statistics, some of which were available in computerized form. Samples of patient records also were collected and reviewed for a more focused analysis.

Technical Efficiency

For technical efficiency, one procedure is considered more efficient than another if it yields improved results with fewer inputs, or produces a greater quantity of output using the same number inputs. Possible output measures are hospital admissions/discharges, outpatient visits,

classes of procedures (lab tests, deliveries, etc.). To assess internal efficiency, outputs are related to inputs, e.g., the number of deliveries per number of staff.

Measures of output are complicated by the need to adjust for the relative severity of patients or the mix of cases (case-mix). This allows for more meaningful comparisons. Commonly used variables to adjust case-mix include principal diagnosis, multiple diagnoses and procedures, as well as demographic variables such as age and sex. Data available were often aggregated, and case-mix adjustment was limited to one general diagnostic category only. Multiple diagnoses data and procedure data were not available in consistently coded form. This meant that a simple pneumonia case, for example, may reveal itself to be different from severe pneumonia with associated diabetes and heart problems. Or, a stroke patient with mild transient ischemic episodes could not clinically be differentiated from another with associated heart complications such as myocardial infarctions or worse. Each will obviously require a different course of treatment and associated resource use.

To adjust for case-mix beyond one diagnostic category, two alternative approaches were utilized given data available. One approach grouped a 100 percent sample of admissions into 3 simplified severity categories according to lengths of stay (LOS). The LOS measure can serve as a relatively valid proxy for resource use (see, for example, Pettingill and Vertrees, 1983). Then, admissions by diagnostic category can be weighted by the relative share of each of three groups.

A second approach is to measure admission costs per case within each diagnostic group. This is a more refined approach, but requires more extensive cost data. Cost data in the FEZ demonstration area was available for only two years (1991-1992), and only for two departments (surgical and internist) of one hospital. This second analytic adjustment, as a result, can be considered only in a limited or illustrative way.

Allocative Efficiency

An examination of allocative efficiency looks primarily at the structural dimensions of the system—relative cost-effectiveness across settings for a comparable case as well as the interaction between medical facilities and alternative settings of care with varying levels of cost-effectiveness. For example, the use of day-care centers for palliative care may provide comparable outcomes with fewer resource inputs relative to a hospital admission. Another example is how simple surgeries may be less resource intensive if performed in same-day outpatient surgical centers, rather than on an inpatient basis. Additionally, the number of hospital admissions may increase as a result of poor performance of polyclinics with a subsequent increase in costs. Or, delayed preventive and primary care services may lead to the need for more expensive acute care services later.

Common measures for evaluating relative allocative efficiency include the ratio of inpatient to outpatient cases, referral rates of patients from general practitioners to specialists and/or for inpatient care, the ratio of general practitioners to specialists, admission rates per 1,000

population, and the number and occupancy rates of hospital beds. An examination of allocative efficiency also can compare unit costs across similar facilities (general hospitals in a region), as well as across different types of facilities (e.g., polyclinics and free-standing general practitioners). These measures and approaches can allow inferences about the relative cost-effectiveness of types of services (e.g., preventive care) as well as types of settings (e.g., home care).

Several general hypotheses were initially developed about changes in allocative efficiency resulting from the demonstration. They include:

- primary care physicians are assuming a greater share of patient care services;
- the ratio between general practitioners and specialists is changing to reflect increased primary care;
- the relative share of inpatient care is diminishing in parallel with changes in allocative efficiency;
- case-mix and corresponding work structure in hospitals are becoming more complex.

These changes might be expected based on the change in incentives from 1) transition to per capita financing and new revenue sources from employer contributions; 2) the formation of groups of primary care providers (APTK) and their role as fundholders; 3) the general increases in incomes and the system of bonuses and penalties; 4) the formation of medical staff teams in hospitals and polyclinics; and 5) the introduction of the quality assurance system.

Findings on Allocative Efficiency

Using data on several measures, analyses indicate a generally positive change toward greater allocative efficiency from 1990 through 1993. Findings include:

- share of visits to internists, pediatricians, and obstetricians (APTK) has increased from 37.2 percent in 1990 to 51.6 percent in 1993; for pediatricians alone, the share of visits has gone up from 12.4 percent to 22.9 percent (see Table 3 located on page 21);
- ratio of general practitioners (internists, pediatricians, obstetricians) to specialists in polyclinics has increased from 1:5.2 to 1:3 (see Table 4 located on page 22);
- number of hospital admissions decreased by 26 percent, with a corresponding increase in outpatient (polyclinic) visits of 24 percent (see Table 6 located on page 24);

- ratio of outpatient visits to hospital admissions increased from 27.8 to 47.5. For Kazakhstan as a whole, this indicator has not changed for a comparable time period and remains at 33;

These data tend to confirm hypotheses that APTK physicians began to take on an increased share of care, but also that polyclinics are shifting concentration to greater provision of primary health care. Additional data on hospitals show that:

- total number of the hospital beds for regular cases has decreased by almost 35 percent, though no facilities have closed. The associated drop in beds per 1,000 population has gone from 14.7 to 10.2 (see Table 6 located on page 24). The reduction in beds was in part due to a shift in beds from inpatient care to new day care centers for palliative care. The change occurred shortly after the initiation of NEM, and occurred through administrative fiat rather than facility-level decision-making.

- hospital admission rates as a whole decreased from 31.55 to 23.9 per 1,000 population (see Table 7 located on page 25). Prior to the introduction of NEM, this indicator was higher than average for all Kazakhstan (23.6). This trend may be due at least in part to factors other than those already mentioned, such as 1) lowered demand for hospital care due to deterioration of conditions (bad food, insufficiency of medicines), and 2) increased fear of losing one's job as a result of illness or admission. Nevertheless, it represents a sizable change over the last few years.

Interviews with TMO managers and physicians indicated that duplication of physician functions in polyclinics and hospitals has reduced noticeably. Rotation of the specialists was increased, allowing physicians in polyclinics to upgrade skills through work in hospitals. There also has been the perception that continuity of care has increased across setting, and that duplicative lab tests and have been reduced. These changes may be attributable to associated quality of care sanctions and penalties as well.

These positive patterns in overall resource allocation, however, have not completely addressed historic structural distortions altogether. Bed capacity is still higher than in Western countries. This can lead to inefficiency, both because hospital beds tend to be occupied and because larger bed capacity has been empirically linked to longer average lengths of stay (OECD, 1993).

In fact, demonstration oblast hospitals continue to admit simple cases which may be treated as out-patient. Record reviews and analysis by local Kazakhstani physicians on the Abt Associates team found a significant number (35 percent) of inpatient cases with diagnosis of minor respiratory diseases, virus infections and mental disorders which are amenable to care on an outpatient basis. In addition, some more serious cases of mental disorder would have been better placed in regional, specialized institutions.

The ratio of referrals for inpatient care from first visits to polyclinics is still far too high at approximately 30 percent. The number of referrals from the local area hospitals to regional

hospitals also grew from 132 to 212 per year. Lack of medical equipment and pharmaceuticals, coupled with relative qualifications of physicians, may account for this increase.

The split in coverage for pharmaceuticals in inpatient settings only, with full co-payment in outpatient settings, also may be skewing incentives for care. Physicians may tend to refer people to hospitals where drugs are provided free (at least formally) when outpatient treatment might be more appropriate.

The general practitioner/specialist ratio for physicians greatly improved, and is more than twice the ratio found nationwide (33 percent vs. 13.6 percent). Nevertheless, the ratio is still far below OECD averages found in other countries (e.g., 70 percent generalists in France and Germany).

Finally, the evaluation identified a worrisome trend in preventive services since 1990 (see Table 8 located on page 26). Preventive services do not appear to be increasing and some may be decreasing, especially vaccinations and contraception services. There is not a clear reason for this, though one possible hypothesis is that capitation payments for all services may dampen incentives for physicians to provide preventive care, at least in the short run. These areas of service may need to be monitored in the future.

Findings on Technical Efficiency

Analyses of changes in technical efficiency from 1990 through 1993, using data on several measures, were less positive and showed mixed results.

- Numbers of the hospital admissions declined from 6,215 to 4,561, or by about 26 percent. The reduction is due in part to shifting some patients to a new day-care center, but this change does not explain the reduction entirely (see Table 6 located on page 24). Expenditures for day-care patients were estimated at 25 percent less than inpatient care, freeing up new resources for other purposes.

- Since the start of the demonstration hospital admissions have declined continuously. For example, admissions declined from 1,064 in the first quarter of 1993 to 964 in the first quarter of 1994. Again the shift of patients to day care treatment does not entirely account for this decline.

- Average length of stay (ALOS) in hospitals has shown a very slight, but downward trend (see Table 9 on page 27). The absence of significant decline is surprising given the detailed protocol and quality standards in place, and may be due to 1) a more complex case mix after the shift of patients to day care centers, 2) the lack of available equipment, supplies and pharmaceuticals, and 3) relatively weak incentives to discharge hospitalized patients before the bed-day payment cap is reached, regardless of relative case severity.

- The number of occupied bed-days increased from an extremely low level of 224 days per year in 1990 to 313 in 1993 (see Table 9 located on page 27). Nevertheless, the level remains below the standard set by the federal Ministry of Health, which is 340 days for urban areas. This may be necessary in part because of greater difficulties by hospitals in predicting demand in less populated areas.

- Total number of the patient-days shows a general pattern of decline for both inpatient beds and for day care centers. This is due to a reduction of total number of hospital admissions (from 31.55 to 23.9 per 1,000 population, noted earlier) while the average length of stay has remained stable.

A less positive measure was hospital productivity. Some increase in hospital productivity could have been expected, due to increased complexity of case mix as "simpler" day-care cases were shifted from hospital care. To test this hypothesis, all hospital admissions were grouped into three "complexity" groups as described in the methods section.

Analysis failed to confirm an increased complexity of case mixes. On the contrary, the analysis showed that case-mix had changed little or not at all, while personnel had increased by 9%. The analysis was limited by partial data, but is suggestive that productivity may be declining rather than increasing. Examples are provided below.

- Case-mix analysis using ALOS show that for medical or "therapeutic" patients the share of the patients treated more than 20 days tended to decline for most diagnostic categories, while the number of the patients in most diagnostic categories with ALOS less than 15 days increased slightly. This suggests that the mix of cases has been changing in the direction of simpler cases. For surgical cases, the number of more complex and of simpler cases both increased. However, the number of the intermediate cases, those with the length of stay from 15 to 20 days, decreased noticeably. Results were similar for gynecologic patients. In general in all three of these main hospital units, the mix of cases has not significantly changed or has become less complicated.

- Case-mix analysis using costs per case was performed for years 1991 and 1992 only, due to lack of data. Table 10, located on pages 28-29, presents results by diagnostic category, in order of increasing costs. Results show the decreasing number of hospitalizations in 1992 relative to 1991 for low cost categories. In particular, there are decreases for acute respiratory infections, cholecystitis, gastritis. Some other cases are more appropriately treated on an outpatient (polyclinic) basis. At the same time, some reduction of the number of the most serious cases, ones that require more substantial resource use, can be also observed. For example, there is a reduction in the number of hospitalized patients with chronic bronchitis, pneumonia, and cardiology diseases.

To better examine whether the average cost per case had changed, individual unit costs were weighted for each diagnostic category by number of admissions. Average cost per case was only

4 percent lower (21 percent weighted compared to 17 percent unweighted average) even after adjusting within each diagnostic category.

Savings, then, may be due primarily to lowered number of admissions, rather than significant efficiencies or savings in average costs per case. Coupled with increases in personnel, this suggests lowered productivity since the start of the NEM. This evidence, while limited, may be useful for further work and analysis. If excessive labor resources exist in the hospital setting, it may provide an opportunity to shift labor resources to strengthen primary care, or specialized areas of care such as rehabilitative care or home care following hospitalization.

Discussion

In summarizing the demonstration in terms of efficiency, several points can be made. The first is new methods of financing, payment, and management promoted structural changes that point to increased cost-effectiveness in the delivery of care. This is largely due to changes in incentives for primary care providers and the formation of primary care groups with physician sub-specialists and internists. The countries of the former Soviet Union and the United States face similar issues related to underprovision of primary and preventive care and the mix of specialists relative to primary care physicians. This demonstration evaluation provides one alternative organizational model and approach that might promote primary care through more decentralized organizational arrangements in the United States, such as health maintenance organizations (HMOs) and preferred provider arrangements (PPOs).

According to a recent study from the U.K. (Tudor-Hart, 1995) the APTK or PCG arrangement offers a potentially quicker, simpler, and more cost-effective route to "socially responsible professional autonomy" than the Family Doctor model in the U.K. National Health Service. The APTK groups emphasize co-operation in a small team with diverse skills, are better able to capture economies of scale and scope, and are less likely to succumb to the "clinical megalomania" of "GPs in competitive FFS markets."

At the same time, there could be some justification for fine-tuning the payment systems incentives. For example, priority services, such as preventive care services, might be paid for on some alternative basis. One alternative is a fee-for-service basis; a second alternative is a bonus payment that is made if a physician has maintained some pre-defined threshold of preventive services to patients.

An interesting postscript to the demonstration is that very recently, the demonstration oblast has instituted changes in the payment method for outpatient care, from the primary care group fundholders to a fee-for-service approach, using a fee schedule of twenty five separate services. Fee levels were calculated using measures of 1) complexity, 2) average time, and 3) input costs. These fee levels are expressed in terms of relative values; that is, a certain number of units is attached to each service to specify its relative payment. Total spending for services is capped by a fixed budget. The budget is divided by the number of units to calculate a conversion factor or

standardized rate of payment for each relative value unit. Actual payment is based on the sum of relative value units for each service. Payment levels are updated periodically for changes in treatment patterns, and more often updated to adjust for high rates of inflation.

Finally, changes in technical efficiency (facility level) in the demonstration oblast were less positive, probably due to cruder incentives for cost-effective provision of acute, inpatient care and because of inflexibility by hospital management in regrouping resources in response to demand. Discussions with administrators indicated an unwillingness to cut-back staff due to labor union pressures and local community pressures to maintain the full employment policies of the former Soviet era.

Payment incentives for hospitals might also be refined to increase technical efficiency in the delivery of services. While crude, the initial incentives were in the right direction. Payment was based on performance (successful completion of treatment) that encouraged more appropriate use of resources and promoted more efficient treatment approaches. Later, new protocols included standards for hospital lengths-of-stay necessary for treatment. Payments per inpatient stay were effectively "capped" based on these bed-day standards. This probably had the effect of creating levels of reimbursement that hospitals could "spend-up" to for each admission, much like TEFRA caps under Medicare in the early 1980s. If, for example, payments were set at average costs with protocols based more on outcomes (e.g., discharge status), more substantial behavior changes (e.g., reduced lengths-of-stay) might be observed.

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Table 1
Data on Kazakhstan and Selected Comparisons
(1991)

Category	Kazakstan	Year (if not 1991)	OECD (Average)	Russian Federation	Turkey	West Germany	U.S.
Demographic							
Population (mil.)	16.8			148.7	57.3	80.1	252
% population >60 years	10	1990		17	7	17	20
GDP/capita ($US)	2,470			3,220	1,780	23,650	22,240
Health Spending as a % of GDP	4.4	1990		3	4	8	12.7
Infrastructure							
Physicians/1,000	4.2	1988–1992	2.4	4.69	.74	2.73	2.38
Ratio GPs to physicians	.13				.93	.68	.15
Ratio nurses to physicians	3	1988–1992			1.5	1.7	2.8
Hospital Beds/1,000 population	13.6	1985–1990	9.2	13.8	2.1	8.7	5.3
Hospital Resource Use							
Admissions as % of population	22	1990	16.2		5.6	20.9	13.7
Occupancy Rates (somatic)	77.8	1990			57	86.4	66.8
Average Length of stay (days)	17		15.7		6.6	15.2	9.1

Table 1
Data on Kazakhstan and Selected Comparisons
(1991)

Category	Kazakstan	Year (if not 1991)	OECD (Average)	Russian Federation	Turkey	West Germany	U.S.
Patterns of Spending							
Hospital (%)	64.3	1990	46.1		19.1	36.6	46.2
Ambulatory (%)						28	29.4
Pharmaceuticals (%)			13.8			21.3	8.1
Outcomes							
Crude birth rate/1,000	21		14	12	28	10	16
Crude death rate/1,000	8		9	11	7	11	9
Infant mortality rate/1,000	32		9.7	20	15	7	9
Life Expectancy							
Males	63.9	1989	72.6		64.1	72.6	72
Females	73.1	1989	78.8	68.4	79	78.8	

Sources: OECD, 1993; World Bank, 1993; Kazakhstan Ministry of Health, 1994

Table 2

Referral Structure in the Health Sector in Kazakhstan

Level	Facility	Population Served
1	5108 feldshers-midwife stations	700-1000
2	1127 ambulatory or rural medical centers/ 830 small cottage hospital (25-30 beds)	1000-5000
3	217 central region hospitals with 200-300 beds each • rural areas, with outpatient and specialist facilities • urban areas: 30 city hospitals	
4	oblast level • regional medical institution	
5	republican medical institutions (approximately 400) • highly specialized and research institutions	

Source: Laurisden, 1992

Table 3

Number and Percentage of Visits to Polyclinics Dzheskasgan Oblast, 1990-1993

Specialty	Year			
	1990	1991	1992	1993
Internists	31,522 (19.1)	27,624 (17.0)	48,572 (25.3)	42,534 (22.5)
Obstetrician	9,438 (5.7)	7,909 (4.9)	12,984 (6.8)	11,688 (6.2)
Pediatrician	20,532 (12.4)	24,580 (15.1)	33,102 (17.3)	43,406 (23.0)
Specialists/Others	103,636 (62.8)	102,445 (63.0)	97,014 (50.6)	91,549 (48.3)
Total	165,128 (100.0)	162,588 (100.0)	191,672 (100.0)	189,177 (100.0)

Table 4

Ratio of Primary Care Physicians* to Specialists in Polyclinics in Dzheskasgan Oblast, 1990-1993

1990	1991	1992	1993
1:5.2	1:4.5	1:3.75	1:2.63

* includes internists ("therapists"), obstetricians, and pediatricians.

Table 5: Inpatient Admissions by Diagnostic Category, 1990-1993								
	1990		1991		1992		1993	
	Number	% of total	Number	% of Total	Number	% of Total	Number	% of Total
Infection and Parasitic	348	5.6	519	8.3	742	13.2	597	13.1
Cancer and Neoplastic	53	0.9	60	1.0	28	0.5	34	0.8
Endocrinopathy	22	0.4	16	0.3	21	0.4	13	0.3
Blood and Homogenic	17	0.3	25	0.4	26	0.5	22	0.5
Psychiatry	27	0.4	35	0.6	57	1.0	50	1.1
Nervous and Sensory	214	3.4	169	2.7	162	2.9	86	1.9
Blood Circulation	499	8.0	499	7.9	407	7.3	260	5.7
Respiratory	1,432	23.0	1,515	24.1	1,225	21.8	1,015	22.3
Digestion	611	9.8	511	8.1	475	8.5	340	7.5
Urological	673	10.8	483	7.7	462	8.2	384	8.4
Pregnancy	1,204	19.4	1,224	19.5	934	16.6	906	19.9
Cuts & Hypodermic/Tissue	204	3.3	166	2.6	169	3.0	171	3.8
Muscular	395	6.4	561	8.9	425	7.6	236	5.2
Inherent Anomalies	8	0.1	10	0.2	14	0.3	12	0.3
Perinatal	12	0.2	4	0.1	10	0.2	8	0.2
Symptoms & Non-Indicative	25	0.4	18	0.3	6	0.1	6	0.1
Traumatic	471	7.6	472	7.5	451	8.0	421	9.2
Total	6,215	100.0	6,287	100.0	5,614	100.0	4,561	100.0

Table 6

Capacity and Admissions by Type of Facility in Dzheskasgan Oblast, 1990-1993

	1990	1991	1992	1993
Capacity				
Beds/l ,000	14.7	10.8	10.6	10.2
Admissions				
Inpatient Acute	-	4,944	4,207	3,531
Daycare	-	1,343	1,407	1,030
Total	6,215	6,287	5,614	4,561

Table 7

Rate of Hospital Admissions per 1,000 Residents

Dzheskasgan Oblast, 1990-1993

	1990	1991	1992	1993
Inpatient, Acute	-	25.3	24.0	19.6
Day-Care	-	6.9	5.3	4.3
Total	31.5	32.2	29.2	23.9

Table 8

Preventives Services Provided in Dzheskasgan Oblast, 1990-1993

	1990	1991	1992	1993
Vaccination	20,216	18,300	19,997	15,015
Preventative Maintenance	9,294	4,844	10,853	9,125
Contraception Services	1,417	1,657	1,392	1,035
Total	30,926	24,801	32,242	25,175

Table 9

Hospital Utilization Statistics in Dzheskasgan Oblast, 1990-1993

	1990	1991	1992	1993
Length of Stay				
Inpatient	-	13.5	12.7	13.3
Day Care	-	15.5	13.0	12.8
All Cases	13.7	13.9	12.8	13.2
Occupied Bed-Days Per Year	224	318	304	313
Occupancy Rate	61.2	87.1	83.3	85.7

Table 10

Comparison of Actual and Weighted Admissions by Diagnosis, 1991-1992

	Number of Admissions		Cost per Admission		Index/Cost per Admission	
	1991	1992	1991	1992	1991	1992
Acute Appendicitis Uncomplicated	56	86	86	592	0.6	0.6
Nephrolitis	11	18	88	885	0.6	0.8
Psychiatric Disorder	33	55	92	569	0.6	0.5
Acute Respiratory Disease	112	53	94	621	0.6	0.6
Burn	33	17	110	884	0.7	0.8
Cholecystitis	66	49	128	882	0.8	0.8
Diabetes	12	19	130	0	0.8	0.0
Bone Fracture	141	130	134	1,009	0.8	1.0
Kidney Infection	55	35	137	1,078	0.9	1.0
Rheumatism Active Phase	2	4	141	1,270	0.9	1.2
Hypertension	106	42	146	834	0.9	0.8
Coronary Ischemia	71	78	149	1,155	0.9	1.1
Neurosis, Neuritis	7	5	151	1,239	1.0	1.2
Chronic Rheumatic Carditits	9	22	151	1,041	1.0	1.0
Angina Pectoris	37	46	155	1,289	1.0	1.2
Gastritis	75	40	161	962	1.0	0.9
Stomach Ulcer	24	21	168	1,114	1.1	1.1
Stomach Ulcer/Duodenal	16	28	169	979	1.1	0.9
Bronchial Asthma	15	11	169	861	1.1	0.8
Acute Appendicitis Complicated	15	18	177	1,462	1.1	1.4

Table 10

Comparison of Actual and Weighted Admissions by Diagnosis, 1991-1992

	Number of Admissions		Cost per Admission		Index/Cost per Admission	
	1991	1992	1991	1992	1991	1992
Anaemia	18	10	196	1,176	1.2	1.1
Acute Cardiac Thrombosis	25	15	207	1,220	1.3	1.2
Chronic Bronchitis	108	70	211	1,114	1.3	1.1
RheumatoidArthritis	42	32	224	1,551	1.4	1.5
Pneumonia	79	57	235	1,059	1.5	1.0
Chronic Coronary Ischemia	6	7	267	1,879	1.7	1.8
Acute Myocardia Infarction	11	10	276	2,199	1.7	2.1
Total	1.185	978	159	1,061	1.0	1.0

MODES OF ASSISTANCE IN ZDRAV*REFORM*

- Technical Assistance
- Training
- Grants Program
- Monitoring and Evaluation
- Dissemination of Information

WHAT IS THE FOCUS OF ZDRAV*REFORM*

- Efficiency
- Equitable Access
- Quality of Care
- Sustainability

PROGRAM RESOURCES

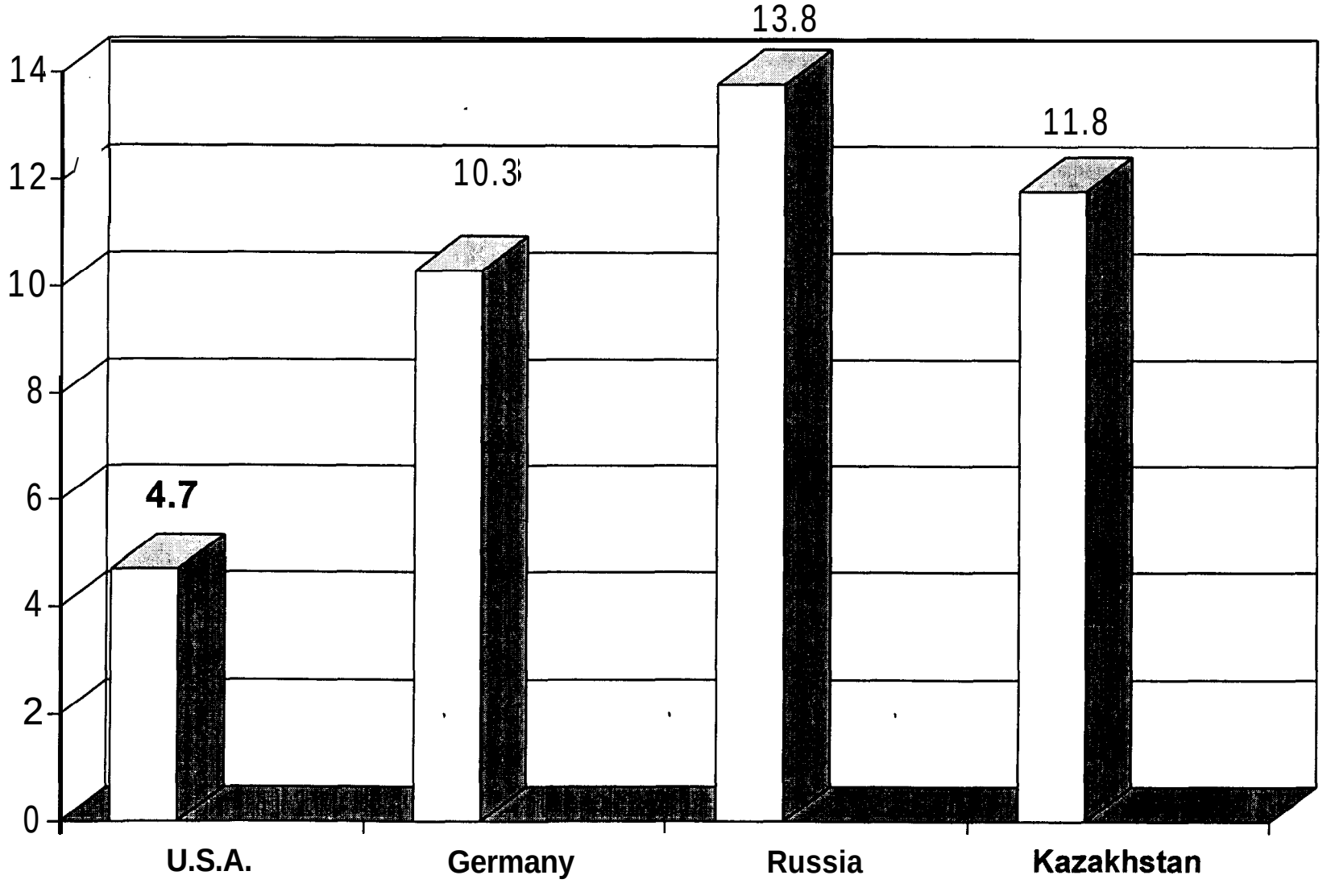
- National Policy Level

- Selected Oblasts: Intensive Demonstration Sites (IDSs)

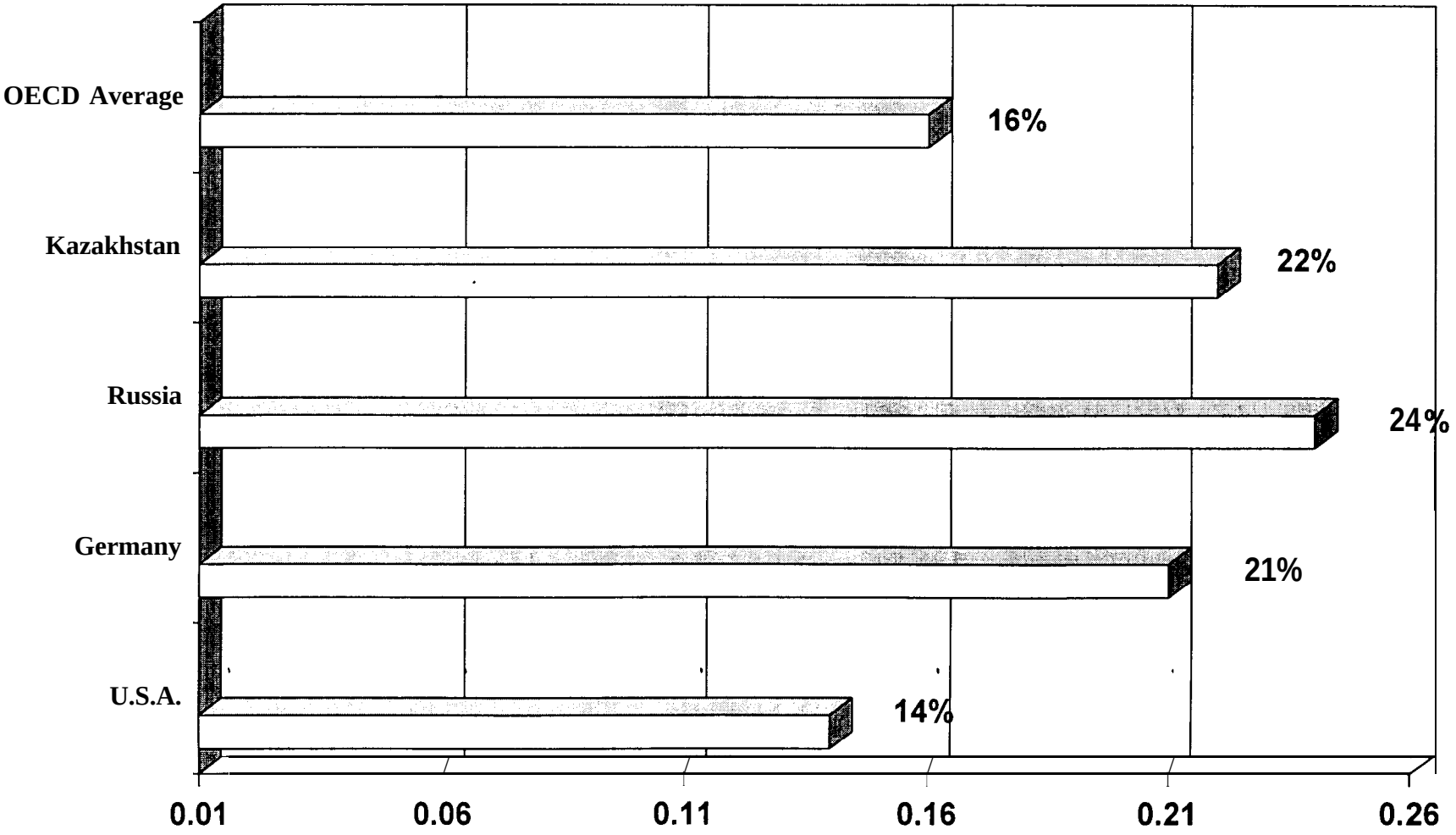
- Geographic Allocation of Resources:
  - Russia: 60 Percent
  - Central Asia: 25 Percent
  - Other: 15 Percent

- Programatic Allocation of Resources:
  - IDSs: 70-80 Percent
  - Non-IDSs 20-30 Percent

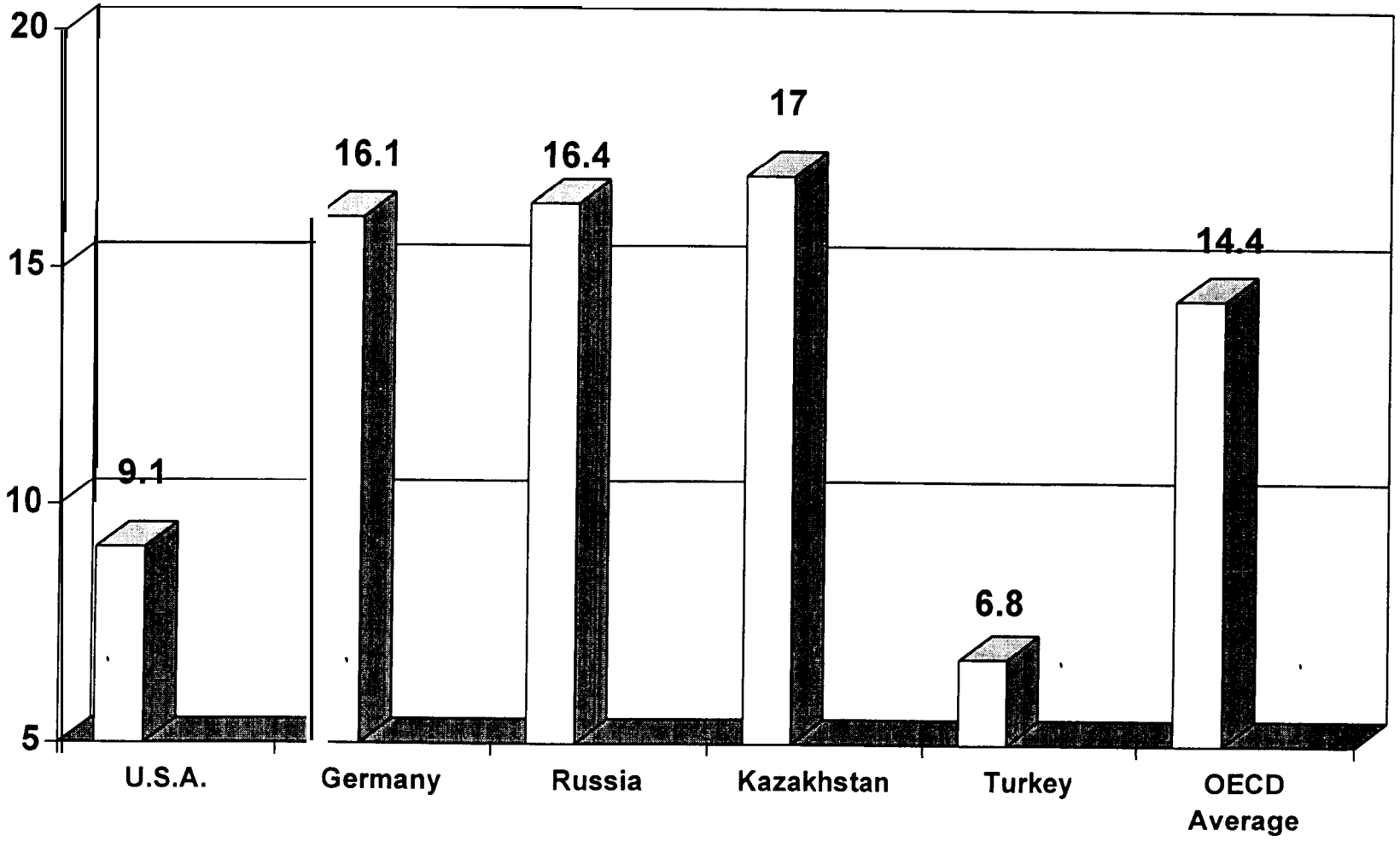
Physicians/1,000 Population



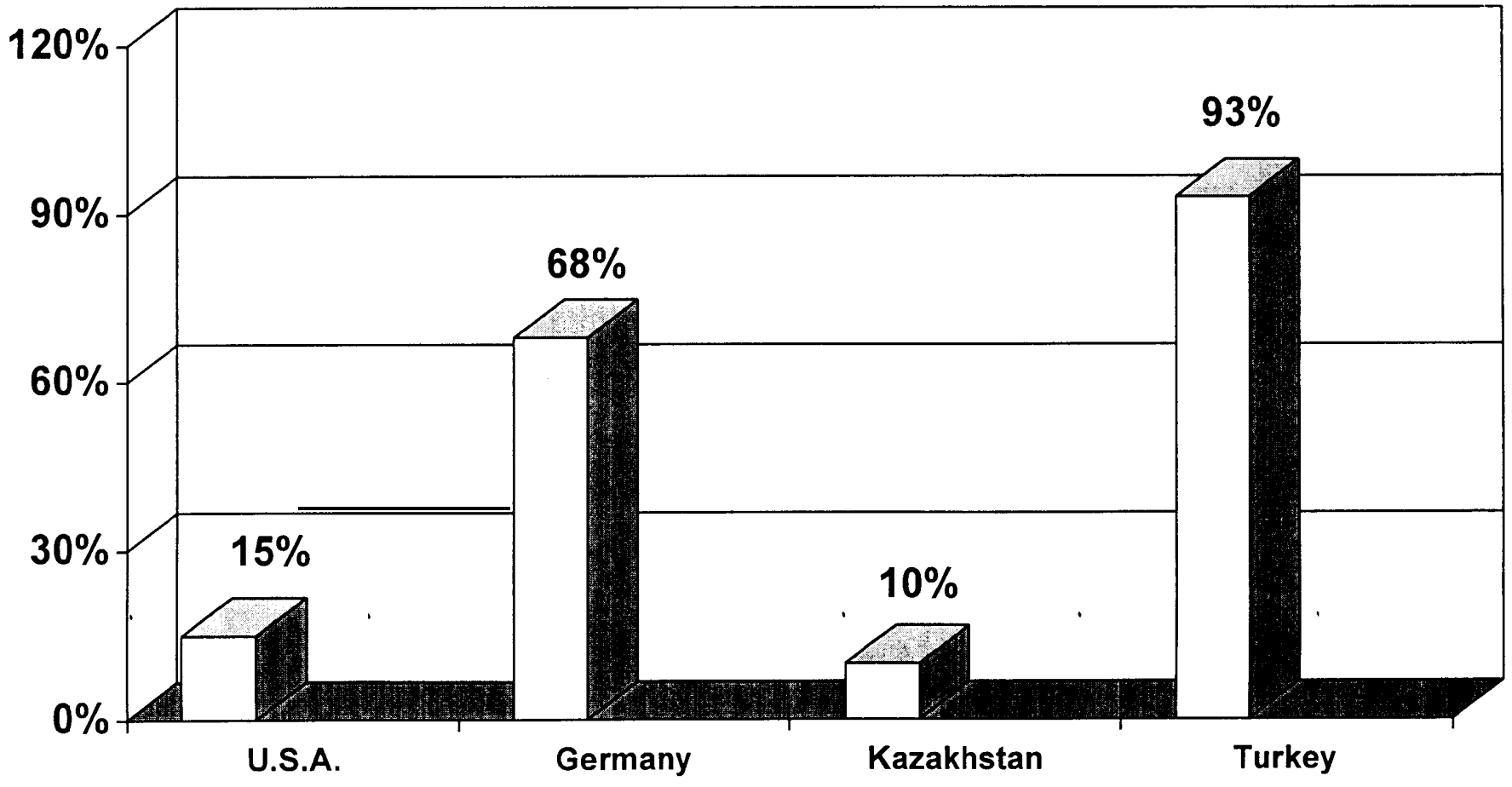
Admissions (percent of population)



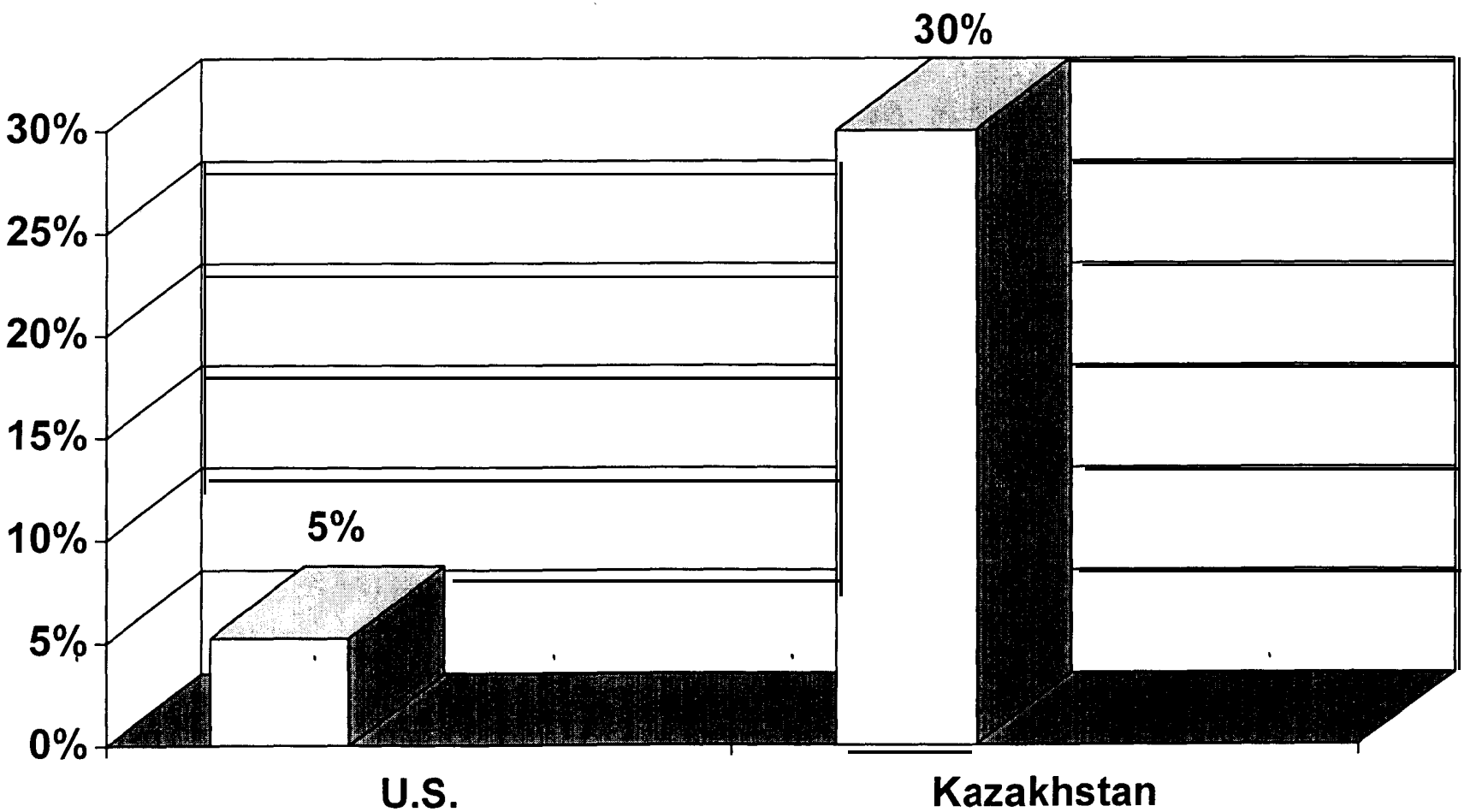
Average Lengths of Stay



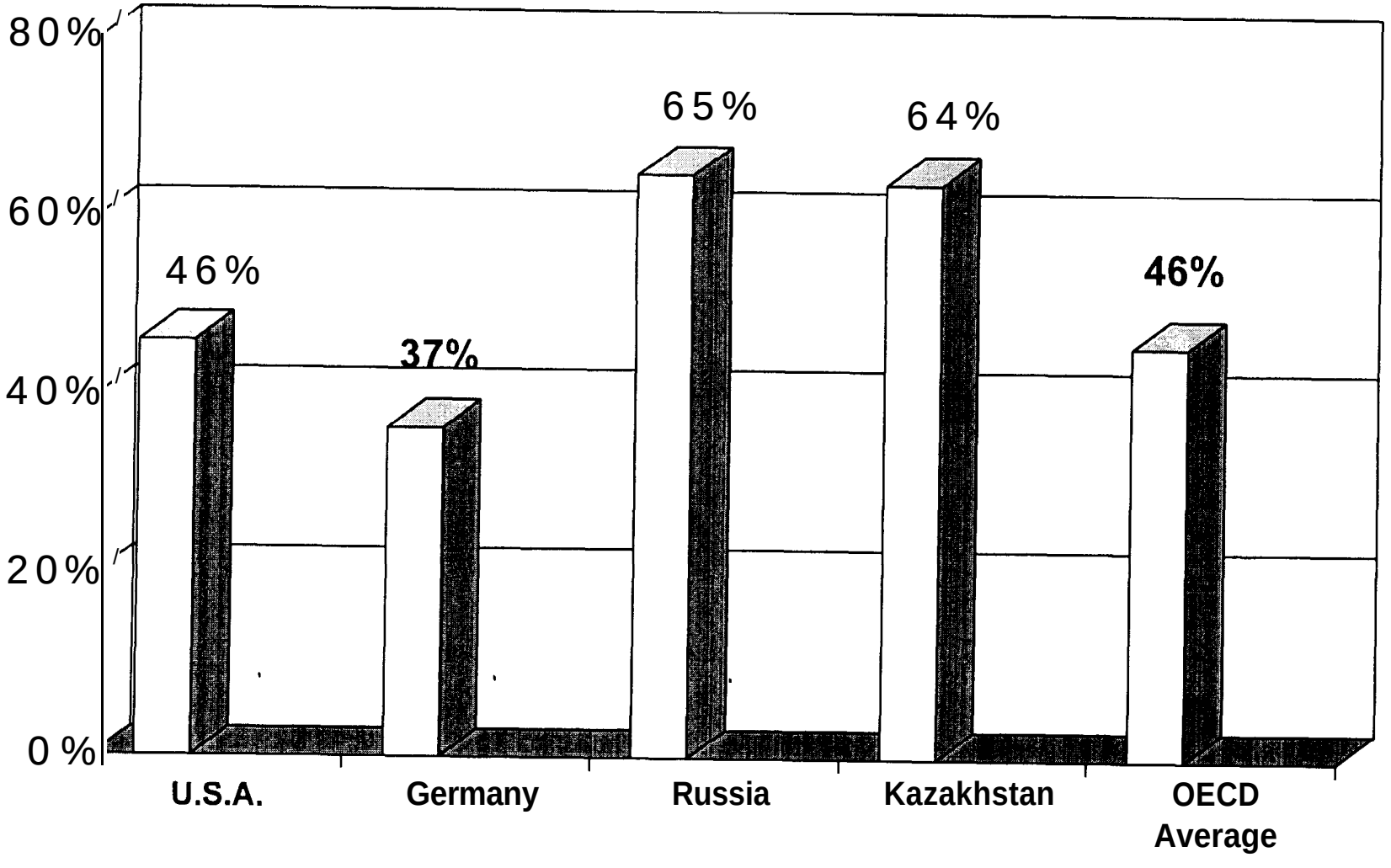
Ratio of GPs to Physicians



Referral Rates (as % of population)



Percent of Resources: Inpatient Care



EVALUATION: HEALTH REFORM DEMONSTRATION

- **International Team**
  - Kazakhstan - Federal & Oblast
  - United States
  - Bangladesh
- **Multidisciplinary**
  - Economists
  - Data Analysts
  - Physicians

DZHESKASGAN OBLAST

- Demonstration Since 1990/1991
  - New Financing Sources
  - Establishment of APTKs (PCGs)
    - Fund-holders
  - Per-Case Payment for Hospitals
    - 7 Categories/ICD Category
    - Bed-Days Standards
  - Quality Control Protocols

MEASURING EFFICIENCY

- Multiple Measures/"Triangulation”
  - Patterns of Change -- Multiple Variables
  - Patterns Over Time
    - Pre-Post Trend Data -- 1990-1993
    - Cross-Sectional Comparisons

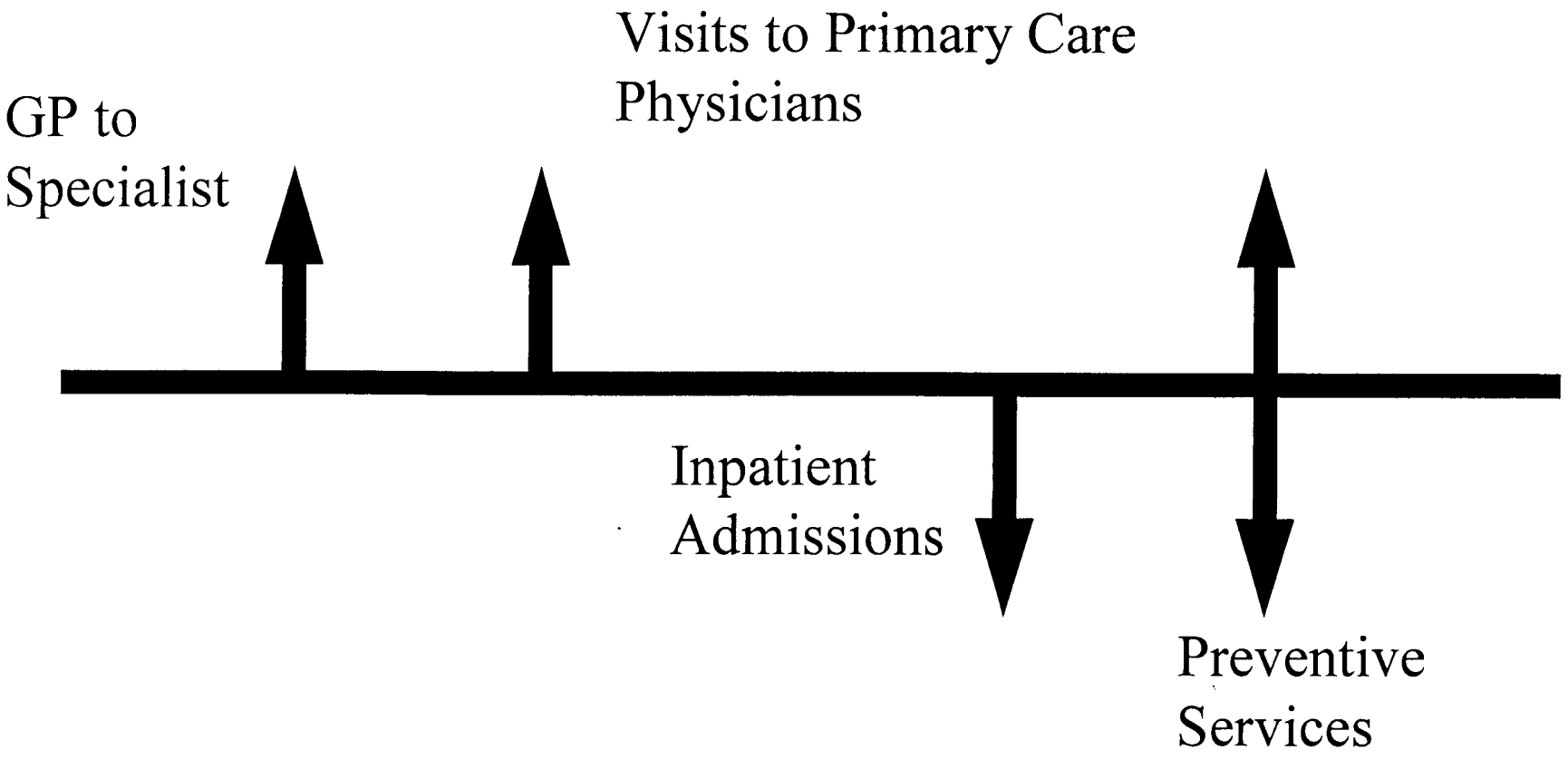
TYPES OF EFFICIENCY

- Technical Efficiency
  - Inputs -- Outputs
  - Data Limitations
- Allocation Efficiency
  - Structural Dimensions
  - Across Settings/Specialty Mix

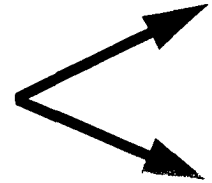
QUALITY OF CARE

- Increased Staff Salaries
- QA System and Protocols
- Specialized Settings of Care

Results: Allocative Efficiency



APTK Model

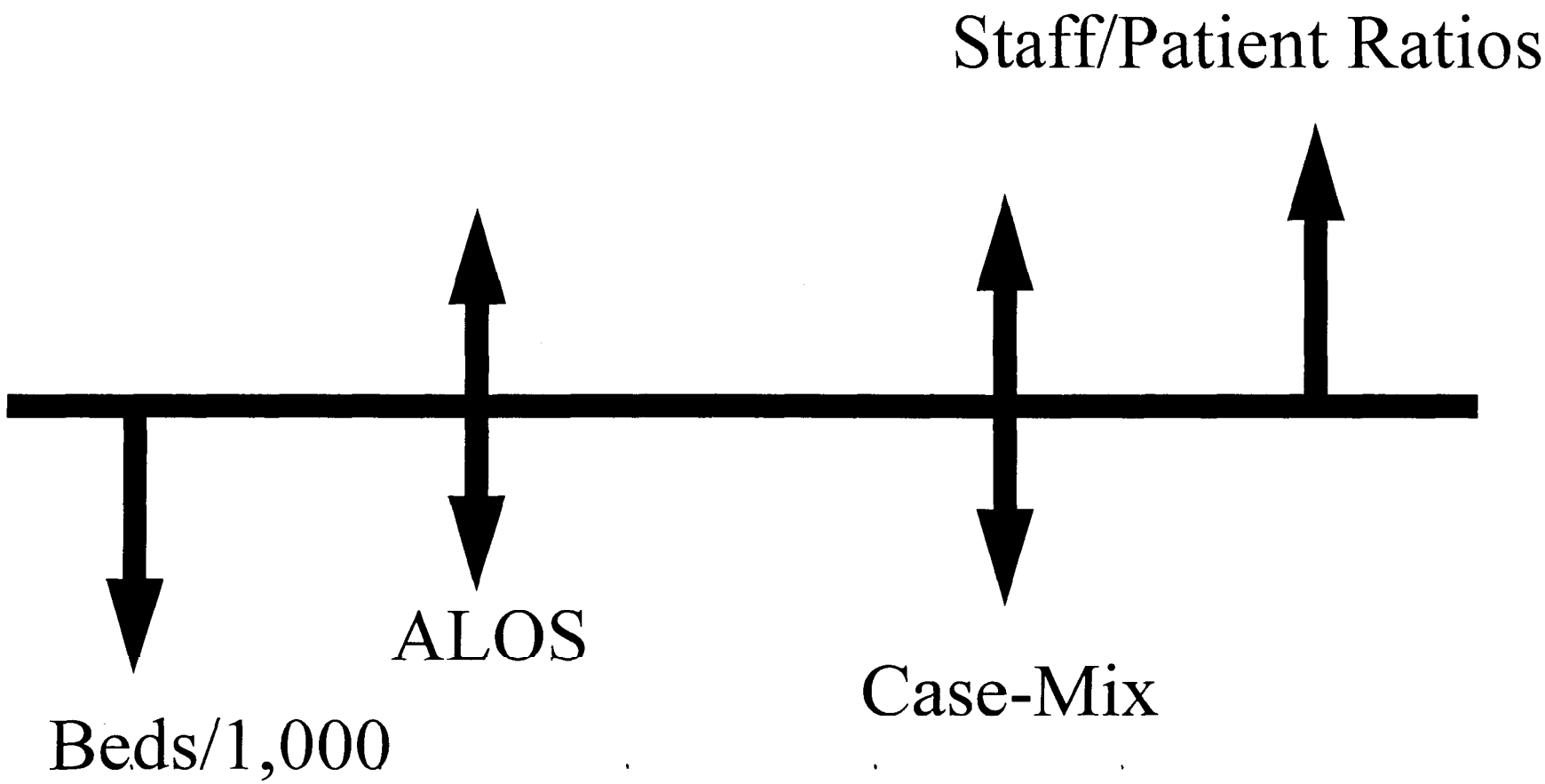
•Cost-Effective Route  Increased Primary Care

Professional Autonomy

- Small Team with Diverse Skills
  - Cooperation
  - Economies of Scale

- No “Clinical Megalomania” of GPs in FFS Market

Results: Technical Efficiency



ADMISSIONS BY TYPE OF SETTING